

Toward a Multi-Core Future

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What is Multi-Core?

- **Intel Multi-core processors** - Intel product architecture where a **single Intel processor package contains two or more execution cores** and delivers, with appropriate software, fully parallel execution of multiple software threads
- From the platform perspective, multi-core advances the compute capability by providing:
 - Great **Multitasking Responsiveness**
 - Improved **Multi-threading performance**

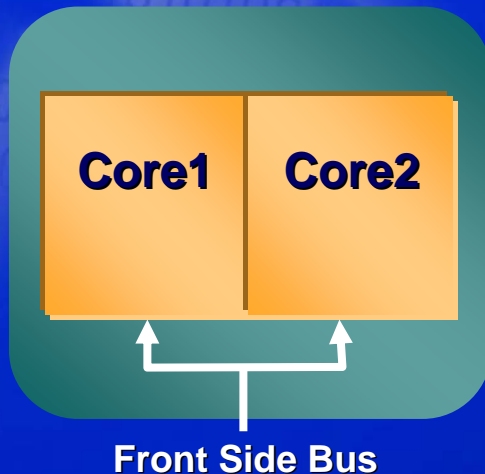
Different Implementations of Multi-Core

- Specific implementations will vary over time - driven by manufacturing cost efficiencies
 - Best mix of product architecture and volume mfg capabilities
 - Designed to deliver performance, OEM and end user experience

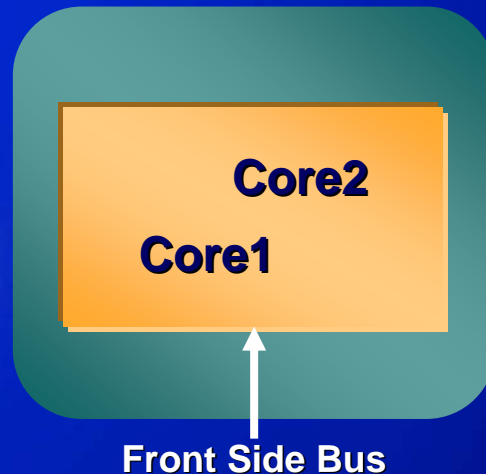
Single-die based processor

Multi-Chip Processor

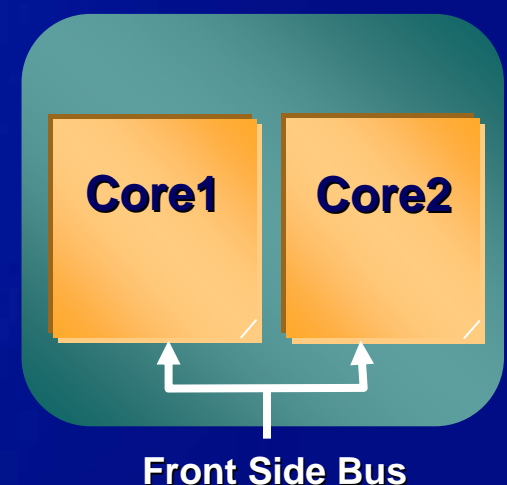
Example: Smithfield



Example: Montecito



Example: 65nm Presler



It all begins with

**PEOPLE
and
Moore's Law**

People's Requirements Redefining Performance

Consumer



“Intelligent” searches of data, ease of use, more sophisticated computer interfaces, digital media management, security

Business/ IT



TCO, security, virtualization, scalability, automation, responsiveness, utilization, platform self-management

Demands will fuel need for more “intelligence” in platforms; use extra performance to make platforms easier to use

User needs are driving the development and definition of future multi-core platforms

Moore's Law Gives us Flexibility

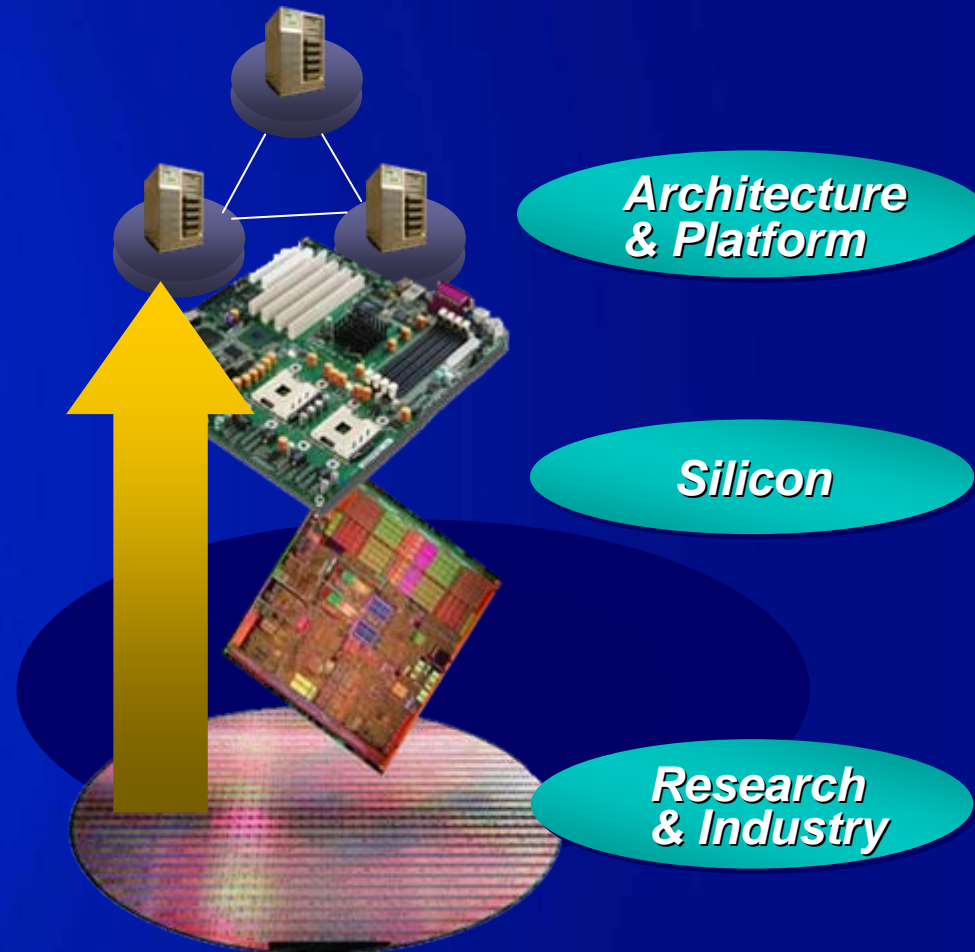
Intel process technology capabilities

High Volume Manufacturing	2004	2006	2008	2010	2012	2014	2016	2018
Process technology Node	90nm	65nm	45nm	32nm	22nm	16nm	11nm	8nm
Integration Capacity (Billions of Transistors)	2	4	8	16	32	64	128	256

- Because we drive the pace of Moore's law, our manufacturing process technology will give us the capability to integrate billions of transistors on one chip
- We will use those transistors to build more cores and other features into our future processors

Intel's Move to Platforms

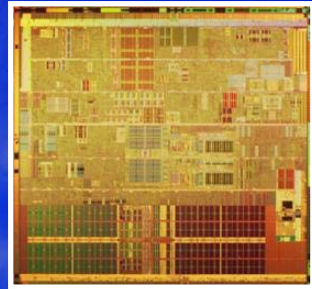
- **Deliver technology solutions that bring value to people**
 - Integrated technologies, hardware, software, ecosystem aligned
 - Applied and tailored to market segments



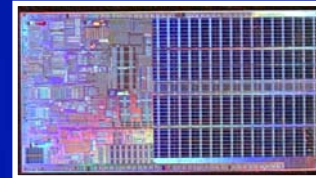
**User Requirements Drive
Architecture and Platform Innovation**

Flexibility of Multi-Core Designs

Historical processor design approach



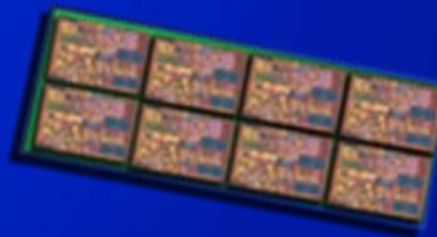
Pentium 4 processor



Pentium M processor

With single-core designs we make tradeoffs between performance and battery life

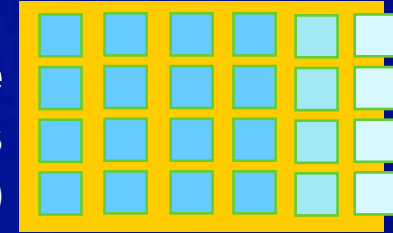
Intel's Multi-core Approach



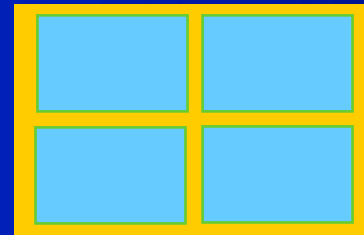
Multi-core designs deliver the right combination of performance and power providing more design flexibility

Intel's Transition to Multi-Core: Built on Our History of Innovation

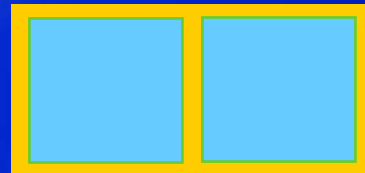
Future
(10's to 100's
of cores)



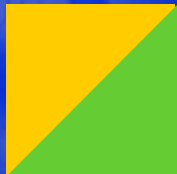
Multi-Core



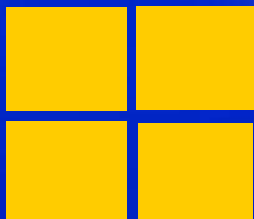
Dual-Core



Hyper-threading
Technology



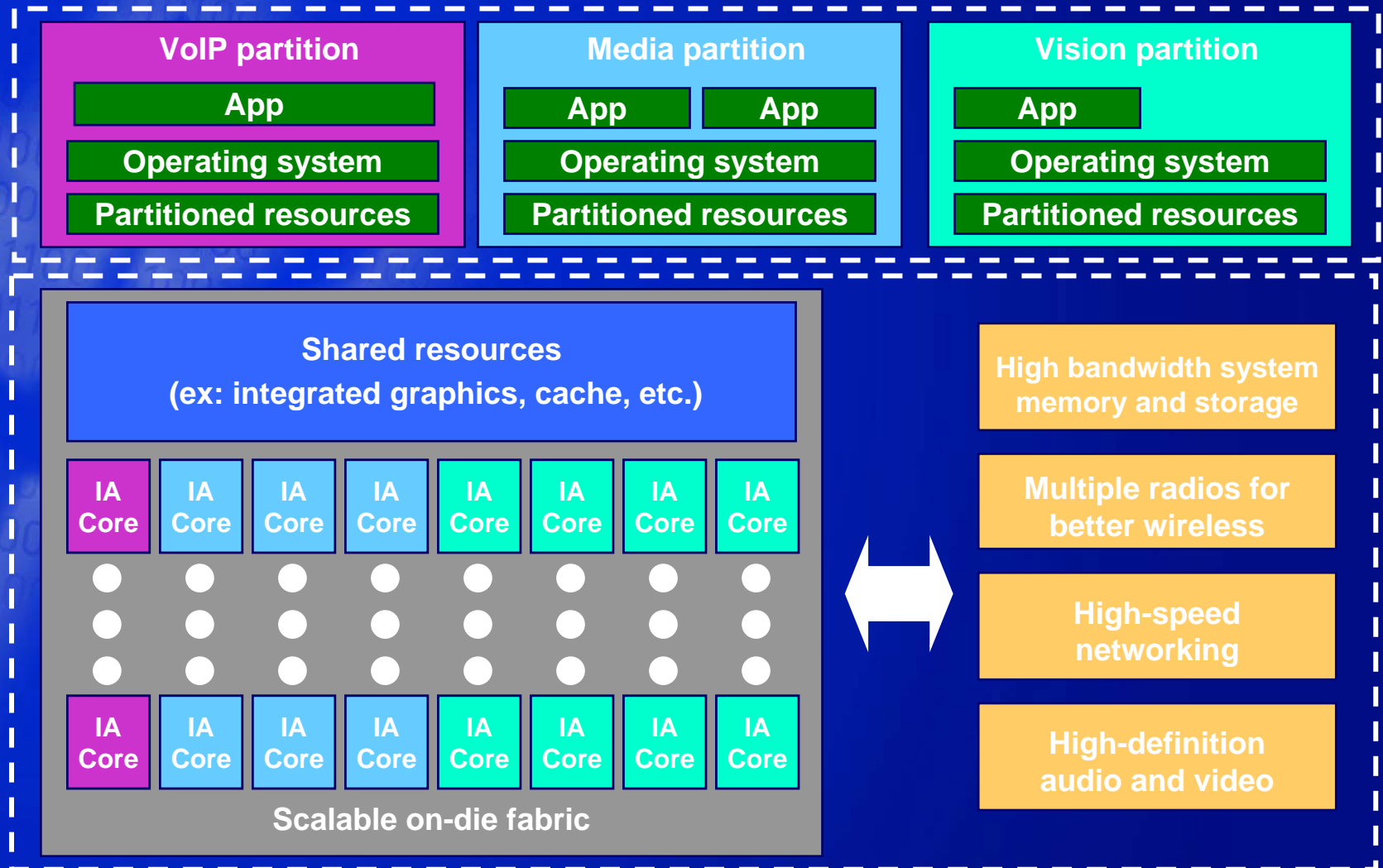
Multi-processor
systems



Delivering Benefits with MC Platforms

Example: Multi-Core combined with VT

Reliable and secure



Discrete, stacked or integrated 10

What are we doing to get there?

ADVANCED PROCESS TECHNOLOGY

MOORE'S LAW

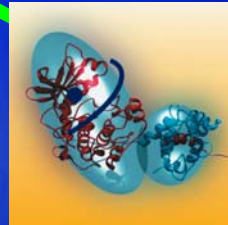


**PLUG-IN
TO IDF!**



OPENING NEW REALMS

Medical Sciences
Cognitive Computing
Real-time Realization



ADVANCED SOFTWARE DEVELOPMENT TOOLS



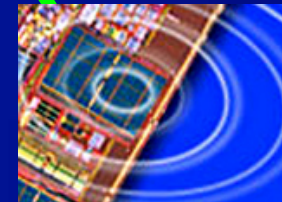
PROCESSOR EVOLUTION

MORE CORES
ENERGY EFFICIENCY
BANDWIDTH



FEATURE ADVANCEMENT

MULTI-RADIOS
NEW TECHNOLOGIES



Q & A